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The Integration of Service, Teaching and Research in Public Health Work

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WE can say that public service, professional preparation and research in health are fully integrated when they are so related to one another and their action so coordinated, that they move forward together, as a whole, toward their common objective; namely, prevention of disease, promotion of health, and prolongation of life.

Our public health service has been developed to achieve this objective. The preparation of personnel, to a large degree, determines the success of our program. Neither service nor preparation can go ahead intelligently without intensive and carefully controlled research into all phases of public health.

Research, when applied to public health problems, shows their extent; it unfolds their origin and their mechanism; it determines their priority and assists in working out solutions that may call for the creation of new services or the reorganization of the old.

At the professional level, *teaching* gives the training without which a public health worker is merely a technician or, rather, just an employee. It adds to character the touch of competence which becomes the most reliable guarantee of the quality of service.

Administration organizes and operates for the whole community the *services* derived from research, either in the laboratory or in the field, usually in both. Sometimes these services are the result of the exploratory work of a voluntary agency and, on a temporary basis, may have been rendered directly to the public on a limited scale. The quality of such services depends mainly

Address at the annual dinner of the Canadian Public Health Association, held during the forty-second annual meeting in Quebec City on June 1, 1954.

on the competence of the responsible public workers, therefore on the professional education that comes from teaching.

Perfect integration of service, teaching and research may not be easy to achieve, but when attained, progress toward their immediate and long-range goal is accelerated. For without teaching and research, service becomes a rigid routine half paralysed by the weight of administration. Without the other two, teaching is too academic and leads nowhere, like a blind alley. Similarly, research alone lacks a purpose; it may consider itself to be self-sufficient, but it will likely remain sterile and bear no fruit.

The need and value of coordination of *research and service* are known to all of us. It is now a well-established procedure to base public health programs on the findings of research. By way of demonstration, many services still have some research value during their testing period.

Scrutinizing the full meaning of mortality and morbidity data is a form of *statistical* research. The numerous surveys that we have witnessed, during the last twenty years, in the field of health or illness, and the small- or large-scale inventories in which several of us have participated, were projects of *sociological* research. Let it suffice to mention the survey of health services (1949–50) and that of illness (1951) as fresh and outstanding examples of such projects which, in Canada, are the basis of future medical care and public health programs.

As to the scientific discoveries that we owe to *experimental* research, they are the classical type of procedures by which investigation has shaped the services that are the responsibility of administration.

Teaching and research must also be linked together very closely. Only by full cooperation between the two can teaching enrich its program and make new knowledge available, thus fertilizing research.

Research in *curriculum making*, and remaking, must be a constant preoccupation of the staff members of our professional schools. Furthermore, all students of public health should be made familiar with the methods of *field* research, particularly the collection and treatment of data as well as the drawing and reporting of conclusions.

There is a saying, received with favor by our profession, that "teaching must be purified through the fire of research"; perhaps this is simply to justify the programs of research developed by the schools of public health. Surely, error must not be taught, and unproven knowledge should be cloaked with reserve; it is through research that teaching can discover truth and use it to its purpose.

Actually, candidates to higher degrees must undertake some original project of research; but all students of public health should, in a seminar or in some other way, present a kind of original study that has required a certain amount of *bibliographical* research. The staff of a school of public health is incomplete if there is not a professor of research along with the professor of administration.

The main responsibility of professional preparation shows clearly the ties that must bind *teaching and service*. Should it go so far, however, as to consider community service a basic function of the school? This is a debatable point. For the field training of its students, it is of course necessary for a school to

have teaching experience available in health centres or units; but this it may obtain without assuming full administrative responsibility for the service itself. The school should not become just another agency; it is and should stay above all agencies. Being the brains of education, in public health, its role should be to guide more than to act as an additional hand or a fifth wheel.

To public health officials, a professional school must give technical advice that will influence administrative procedures. Not only should it do so upon request, but it is expected by administrators so to do when deemed useful. This sort of relation can be informal in many instances. With the presence of part-time teachers on the faculty, such cooperation becomes quite natural.

These people, drawn from public health services, are just as necessary as the prescribed number of full-time professors or associate professors. As public health practitioners, they can best keep teaching in touch and in line with the field developments, problems and resources of the hour. They do not tend to become theorists, not to say mystics, imprisoned in the ivory tower of education, but help to translate into practice the findings of research that are quickly embodied in up-to-date programs of studies.

Who should take the lead in a particular instance is not always clear; it would seem that the one who sees first the applicability of new knowledge has the responsibility of taking the initiative. The process is an easy one when, within the frame of public health planning, service, teaching and research are properly represented and have frequent contacts.

It makes little difference whether coordination is brought about under the auspices of one party or another. The Dominion Council of Health and the Federal-Provincial Conferences are appropriate occasions for integration at the national level; an advisory body would be just as useful in every province; the council of a teaching and/or research organization may serve the same purpose.

However, this sort of gathering should not take place only twice a year or once a month and in a formal way. The spirit of cooperation must permeate day-to-day activities of all responsible persons, who should take advantage of the many situations that offer themselves to this end.

In a school of hygiene, seminars appear to have value if, instead of being an exclusive pedagogical procedure, they serve as one-room workshops, without any partitions between service, research and teaching. The student's original work and especially the group discussion that follows invite all participants to throw their ideas into the melting pot, without any tag on them, in perfect team work.

As an example, here are, in substance, the conclusions that may be drawn from a seminar that took place at the School of Hygiene of the University of Montreal on January 28, 1954, on "The Role of the Agronomist in Public Health".

Some agronomists, during the fourth year of their professional training in the Province of Quebec, specialize in milk technology. Apart from the study of milk products, such as butter and cheese, their program comprises courses in milk production and processing, including chemistry, bacteriology and sanitation, for which they get 15 credits (1 credit being equivalent to 15 hours of theory or 30 of laboratory).

On top of that, some of these graduates spend one full year at the Provincial Dairy School, at

St. Hyacinthe, where they acquire 10 additional credits, for more advanced work, making a total of some 25 credits in milk technology alone.

This is to be compared with the program of studies of a veterinary doctor who, in this Province, gets about 2½ credits for the same subject. As for a sanitary engineer, his studies in milk production and processing are too short to be evaluated in term of credits.

Evidently, an agronomist who has made such a complete study of the theory and practice of milk industry, is an ideal candidate to assume the direction of any establishment concerned with the production and processing of milk and milk products. But it appears also that such a person could be put in charge of milk sanitation in the health department of a province or of a large city, in preparation for which he should also register for one year in a school of hygiene.

Naturally, in the course of his official duties, he will need the services of the veterinary profession with regard to the contagious diseases of bovine origin and those of the sanitary engineer with regard to the mechanical problems that develop in pasteurization plants.

For the same reason, it is proposed that the inspectors working under him in the field of milk sanitation (from production to distribution) be also agronomists similarly specialized, who then should take a three-month course in sanitary inspection and obtain the Certificate in Sanitary Inspection (Canada).

Another aspect of the role of the agronomist pertains to general sanitary inspection in a rural county health unit. The functions of this service are quite diversified. Apart from milk inspection, they include the supervision of such miscellaneous items as drinking water, sewage and refuse disposal, housing, public eating places and other food establishments, plus a whole list of nuisances too well known to all of us.

In this realm, again the agronomist would be an ideal candidate for the control of milk sanitation; but in a rural area, contrary to the situation that prevails in urban centres, it is impractical to divide the functions of sanitary inspection into several specialties (meat, milk and so on).

Moreover, there are already veterinary doctors in private practice and agronomists in public service (employed by the Department of Agriculture) who are in a position to advise farmers on their problems.

Therefore, it is felt that, in the field of rural sanitary inspection, an agronomist would debase his professional qualifications, while his services would be especially valuable in milk sanitation for a large health department.

Now, where is the value of this seminar for the integration of service, teaching and research? First, these conclusions required a bit of research, several consultations and a good deal of thinking.

Second, our administrators who participated in the discussion are now on safe ground to revise their milk sanitation service and give correct orientation to the studies recommended for those whom they will place in this field with better defined functions.

Third, the pedagogical council of the school is now under the moral obligation to reconsider its course on milk sanitation, with the advice of a veterinarian, an agronomist and an engineer, in order to define the contribution of each one, since the services of the three are necessary to assure all aspects of milk safety.

Such follow-up alone can bring about the practical application without which a discussion remains academic and coordination falls short of complete integration.

This is, among many, only one example of the integration value of contacts and discussions in public health work. A similar approach should be attempted with regard to the many facets of organization plans, training programs and research projects.

Most of our long established services deserve this treatment. It is by such integration that we can and shall progress in many fields:

in vital statistics, from exact compilation, to scrupulous analysis and interpretation of health data;

in epidemiology, from the reportable diseases, now mostly under control, to the application of epidemiological methods to public health problems connected with other forms of morbidity and with accidents;

in sanitation, from the engineering achievements of yesterday, to the problems of stream pollution and air contamination and other unsanitary practices awaiting the intervention of the veterinarian, the agronomist or the architect;

in medical care, from assistance to the indigents, to health recovery arrangements for the whole community;

in mental health, from preventive psychiatry applied only to problem children, to real mental hygiene as needed by all who are being aducated in the family and at school (after all, nutritionists do not teach food hygiene only to children suffering repeated indigestion; why should mental hygienists concern themselves primarily with youngsters who have developed behavior problems?);

in maternal health, from lip service, to effective peri-natal care;

in health education, from old clichés, to due emphasis on such unsolved problems as home accidents and school health instruction, especially the nutritional aspects of personal health.

But, for dental health to progress, I dare say we should reverse our direction and, from palliative measures, turn back to the fundamental nutrition problem which, from the prenatal period, is at the root of dental caries. Some scientific papers, in reviewing the accomplishments and predicting the developments of dental public health, do not even mention nutrition, just as if there existed no relation between the two. Yet, who will believe that bad food, plus a trace of fluorine, will turn out good teeth?

Similarly, we can accelerate the establishment of new services, either within the walls of public health laboratories or in the open field of chronic diseases, the favorite ground of our leading causes of death.

We would never have witnessed the present sanitary achievements in our environment nor the control of many contagious diseases without the epidemiological methods and the principles of administration that were applied to the mass phenomena of public health.

For a public health problem to be solved, we need some unity of direction and orientation; then, it can be properly studied; a total program of prevention, case-finding, treatment and rehabilitation is prepared, based sometimes on appropriate legislation; all available resources, professional and institutional, are tapped; those missing are obtained and all are put to work in joint action; team work progresses, preceded by professional and public education, accompanied by research, supported, where and when necessary, by consultation; and the whole program is reoriented, if need be, according to the indications derived either from new scientific discoveries or from the periodic evaluation of results.

Many are convinced that such a plan of attack, prepared and applied systematically, would also make it possible to control cardio-vascular renal diseases, mental illness, probably diabetes, maybe cancer, and possibly other conditions of a still obscure origin.

In fact, we may agree that the same principles and methods, adopted by paediatrics yesterday and by obstetrics today, should apply as well to the whole of clinical medicine, rehabilitation included.

We must not take a disinterested view of these unsolved problems of public health, any more than physicians can neglect their responsibility in preventive medicine. For prevention, treatment and rehabilitation are essential components of true clinical medicine.

Our primary responsibility toward preventive services carries the moral obligation to organize the recovery of public health, in cooperation with practising physicians, by the distribution of proper curative services, wherever prevention is still impossible or whenever hygiene has failed.

The health officer is the person ultimately responsible for all aspects of community health. Upon him rests the sacred duty to protect it at all stages and under all conditions; he cannot neglect, or even forget, any of its problems.

It is no longer permissible to attack such problems by service or teaching or research alone, or by the three separately, for these weapons, when supporting one another, multiply their respective efficiency. It is under the cover of a well-fitted tri-segmented shield that the health of the public can be adequately protected.

When the three are joined together, the *administrator* raises his sights above matters of appointments, salaries and recommendations and talks in terms of services designed to solve problems; the *professor* forgets about schedules, examinations and marks, and becomes keen in bringing the fruits of research to the students he must train; and the *researcher* himself, forgetful of his pet project or experiment, becomes aware of the possibilities offered in many directions by the several types of research; touching the fringe of *philosophical* research, he elevates and broadens his concepts far above the particulars of a single discipline and far beyond the limits of a narrow area.

In this era of fantastic developments in the medical and biological field, with the interaction of the various scientific disciplines related to medicine and hygiene, it is safe to conclude that the future of any institute, any school, any department, depends on complete integration of service, teaching and research in public health work.

Hay Fever: A Public Health Problem

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HAY fever is an allergic disease which is becoming ever more important as a public health problem. Its consequences are almost everywhere realized. The preventive and control measures being adopted consist chiefly of the elimination of the causative agent by the eradication of noxious weeds, especially ragweed.

Hay fever is an allergic disease which is related to asthma and the common cold. It affects the mucous membranes of the eyes, the nose, the palate, the throat, and the bronchi. Those suffering from hay fever experience a burning sensation in the eyes, which redden and weep; and a tickling in the nose, which causes violent and repeated sneezing. The throat becomes irritated and the nasal tubes congested to the point of causing difficulty in breathing. The patients do not feel well; they lack appetite, lose sleep, and are not inclined to work; indeed, in the most serious cases, they must remain at home.

Hay fever is chiefly caused by inhaling the pollen of ragweed, which affects the respiratory tract. Only those who are sensitive or allergic to this or similar pollen are affected.

From an epidemiological point of view, we can determine the period of the year and the probable duration of the incidence of this affliction. The proportion of the population who are liable to attack has also been roughly established at about 2.5%. Thus with our metropolitan population of approximately 1,400,000, we can anticipate that some 35,000 persons in Montreal will be affected annually.

Pollen and Hay Fever

Pollen, a dust generally of a yellow color which is found in the male organs of plants, is liberated when it is ripe. The pollen of many plants is carried by the wind to great distances. There are three types of pollinosis or hay fever, occurring during the period when the plants whose pollen is toxic are ripe:

(1) The spring type (April and May), due to tree pollens, such as oak, elm, maple, pecan, birch, cottonwood.
(2) The summer type (June and July), due to grass pollens, such as wheat and corn rust, smuts (in Bermuda).
(3) The fall type (August and September), due chiefly to ragweed pollen.

The main problem in which we are most interested today is ragweed pollen. It is present in the atmosphere in certain months of the year, causing pollinosis

Presented before the Public Health Administration Section at the forty-second annual meeting of the Canadian Public Health Association, held in the Château Frontenac, Quebec, May 31–June 2, 1954, in conjunction with the annual meeting of La Société d'Hygiène et de Médecine Préventive de la Province de Québec.

or hay fever in susceptible persons who inhale it. The pollen affects the respiratory mucous membranes of the human body. Everyone is not subject to it, only those who are allergic to this kind of pollen.

"The pollen of ragweed is a tiny granule, light and yellowish, enclosed in the male organ of the plant. It is a little sphere, covered with spines, which appears like a golf ball under the microscope. This pollen, dry and powdery, light and floating in the air, is easily caught by the wind, the insects and the birds, and can be carried to far-away distances. It constitutes the male reproductive element of the plant and fecundates the female element to give the seed." (1)

There are three kinds of ragweed: great ragweed, small or common ragweed, and false ragweed. These weeds are annual plants, with a little developed taproot and non-poisonous to the touch.

In Montreal and surroundings, great and small ragweed are very frequent and are still the cause of a large number of cases of pollinosis. Ragweed is found more frequently along streets, lanes and unpaved sidewalks, in yards, gardens, lawns, in vacant lots and parks, near houses and sheds, and in cultivated fields. Gaspesia is free from ragweed.

Period

When ragweed ripens, its pollen breaks loose, to fall on the ground or be carried away by the wind and fecundate the flowers. The transfer of pollen to the ovulum is called pollinisation. This process usually starts around the 12th of August and ends approximately by the 16th of September (2). During this period, the air becomes loaded with pollen, inducing hay fever in people allergic to it. Before and after pollinisation, nobody will get the disease, as the air is free of pollen.

Graph 1 shows that in 1953 pollen counts were at their peak between August 21st and September 7th.

Meteorological conditions, which have a definite bearing on the growth and development of ragweed and on the transportation of its pollen, are also active in modifying the intensity of hay fever. Rain, sunshine, degree of temperature, humidity of the atmosphere, velocity and direction of wind, are all factors greatly modifying the behaviour of the plant and, thus, the progress of the disease. Generally speaking, allergic people are more susceptible to the disease on hot and clear days than on cold, dull and rainy days.

Allergy is defined as the sensitivity of the individual to certain substances which cause unfavourable reactions in his body. Some individuals are allergic to food, such as eggs for instance; others, to fruits, meats, etc. Still others react to certain toxic products, and even to non-toxic ones such as the pollen of plants.

Among the two general categories of noxious weeds, there are the dermatitis plants—poison ivy, wild parsnip, and nettle. The first two are more frequently encountered. The dermatitis plants cause less serious trouble but are very annoying and manifest themselves by blistering of the skin if it has been in contact with them. It is among children that more ravage is caused, although the condition is of a temporary nature. Children playing in vacant lots and in

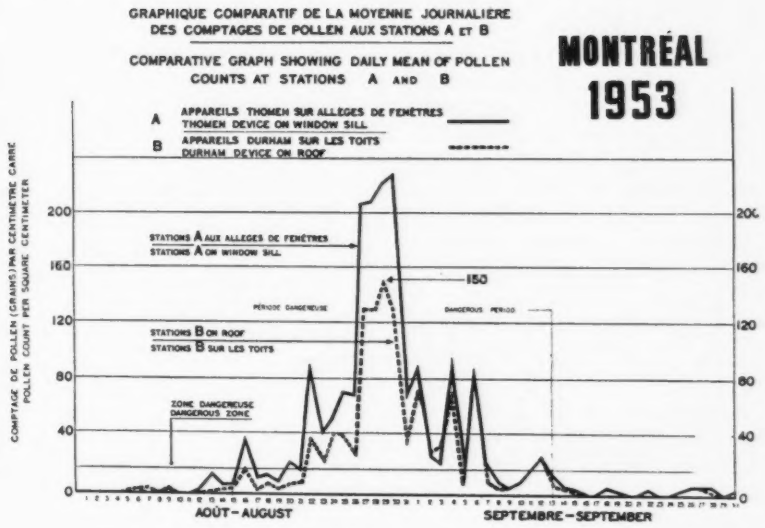

FIGURE 1

the country usually do not know how to recognize these plants and thus are especially exposed. Parsnip is easy to recognize and, fortunately, easy to destroy.

These weeds, especially poison ivy and parsnip, contain a latex which, on contact with the skin, causes dermatitis in certain sensitive individuals.

Prevention and Control

The importance of the problem of noxious weeds and of their danger necessitates a collective effort involving the participation of the municipal and provincial authorities and the co-operation of the public, in order to contribute to the destruction of the weeds and, by the same token, to promote public health.

The general methods for the control of noxious weeds are legislation, education, and eradication.

Legislation is a basic measure, enabling action to be taken, through special laws or by-laws, to force people to destroy noxious weeds on their land.

Education: Control is also a matter of education of the public, and of children in particular, through illustrated booklets, posters, radio talks, exhibits, special campaigns, etc.

Eradication: The general methods of control of noxious weeds include eradication, cutting, digging out and mowing, and finally—the best and easiest method—spraying with an herbicide in solution.

In the City of Montreal, all these methods have been attempted. Spraying with a toxic herbicidal substance, distributed by appropriate nozzles and in the proper amount, has given the best results.

Work Done in Montreal

The City of Montreal was, I believe, among the first cities in Canada and in the United States to combat noxious weeds and to undertake such work on a practical basis. If my memory is good, only the City of New York preceded us in this type of work, by one year. Other cities, among them Detroit, initiated similar campaigns in 1949, and Toronto did so in 1953.

Before 1940, little was done in Montreal to destroy ragweed. In that year the civic authorities, upon the recommendation of the Department of Health, adopted By-law No. 1622 concerning noxious weeds. This enactment required all owners of lands on which there were noxious weeds to take the necessary steps to destroy them.

At the beginning, owners of private lands were notified by the Department of Health; these notices served chiefly to educate owners of lots, as no legal procedures were taken against them.

The enforcement of this by-law gave rather poor results. Some owners were absent from the city during the summer. Others lacked the knowledge or ability to identify ragweed. It also was difficult to obtain the necessary labour and material to conform to the notice. All this impeded the control program.

The success of such a campaign should depend on the co-operation of everyone. Certain owners complied with the notices, others did not. In the following years, practically nobody complied with them. The City, through its Department of Public Works, then offered to mow down ragweed on private land.

In 1943 Notre-Dame-de-Grace Community Council demonstrated the spraying of vacant lands in the district, using a chemical substance called "Ammate". Unfortunately, all growth on the land was killed and the soil was rendered sterile for a number of years.

During the same year, a survey of land where ragweed was growing was made. These efforts proved to be a good contribution to the education of the public.

In the summer of 1945 a campaign was organized by "La Société canadienne d'histoire naturelle" in co-operation with the Municipal Departments of Health and Public Works, to educate the children attending playgrounds, and to encourage them to take an active part in the campaign to eradicate ragweed. August 12th to August 16th was designated "Ragweed Week" and the children who collected the highest number of ragweed plants received a prize.

All these efforts proved to be insufficient, however. On November 6, 1945, a resolution was adopted by the Council of the City of Montreal, asking the Executive Committee to study the better enforcement of By-law No. 1622 for the destruction of noxious weeds. The Department of Health believed that there was no better way to eradicate ragweed than to have the work done by civic employees, whether on private or on public property.

In 1946 a poster contest was organized by "La Société canadienne d'histoire naturelle" and the Department of Health. Several prizes were awarded for the best posters.

A float showing the destruction of noxious weeds was also prepared by the Department of Health for a parade organized for the spring beautifying campaign.

In July of the same year, a demonstration of spraying was given by the

Department to the civic authorities and guests from suburban municipalities, in co-operation with the Provincial Department of Agriculture, which had placed one mechanical sprayer at our disposal.

In 1946 we spent much time surveying in advance before spraying lots that were infested with ragweed.

In 1947, encouraged by the results of previous experiments, the City bought three mechanical sprayers and put them at our disposal. Then we really started the work, making no distinction between private and public property, considering weed control—i.e., eradication of ragweed and other noxious weeds—as a measure of public security. Throughout the city, municipal employees from the Department of Health or the Department of Public Works sprayed vacant lots, golf courses, playgrounds, and the Mount Royal Park, etc. From that date the results became definite and satisfactory. We have since followed this procedure.

In 1953, with the creation of the new Department of Parks, the program was continued. This year, the Department of Parks will complete its set-up with personnel and equipment. In addition, the workmen and chauffeur of each jeep will be under the supervision of a crew leader. Each crew will be instructed in its work by Dr. Emile Jacques, phytopathologist and Assistant Superintendent of the Division of Trees in the Department of Parks. The whole activity will be under the general supervision of the sanitary inspectors of the Division of Sanitary Inspection in the Department of Health. In brief, from this year on, the Department of Parks will be in charge of the execution of the work, under the supervision of the Department of Health.

Equipment, Herbicides and Procedure

The equipment used consists of three mechanical sprayers, each mounted on a jeep and equipped with one piston pump. Each jeep has a hundred-gallon tank and two hoses $\frac{3}{4}$ inch in diameter, one 75 feet long and the other 125 feet. Each hose has 4 jets that can cover an area of ground 5 feet wide at a distance of $2\frac{1}{2}$ feet from the ground; these jets are used on rough land. On level land a boom is used, to which are connected 12 jets, $1\frac{1}{2}$ feet apart, thus covering an area of ground 18 feet wide. Each jeep has a crew of 6 men, including 4 men for the spraying, 1 driver or chauffeur, and 1 crew leader. A sanitary inspector of the Department of Health supervises the work. A trailer is used for the transportation of personnel and equipment, such as hand sprayers, tarpaulins, chemicals, etc.

The tank is filled with water at a fire hydrant, and the chemical solution is added by the inspector. The solution is continually stirred by means of a compressed-air agitator, to ensure a uniform solution. The concentration adopted is $2\frac{1}{2}$ quarts per 100 gallons of water, plus or minus, depending on the season.

Herbicides

The herbicide used today is 2,4-D at 40% concentration.

Among other herbicides used, we found that ammate destroys ragweed completely but also affects other growth on the land and renders the soil sterile for a few years.

In 1946, other herbicides were tried, including atlacide, sodium chlorate, a mixture of sodium chlorate and ammonium sulfate, and 2,4-D. Atlacide was found fairly satisfactory. Sodium chlorate was effective but was inflammable and consequently represented a danger to the employees; in fact, two were burned and had to be hospitalized. Sodium chlorate with ammonium sulfate has no fire hazard but caused difficulties by clogging the nozzles of the sprayers. 2,4-D was considered the most practical herbicide and we are using it again today.

2,4-D is a solution of an acid called dichlorophenoxyacetic. This solution is sprayed on the plants and destroys only plants with broad leaves, without affecting the grass. This selective quality of 2,4-D makes it very practical. We use two solutions of 2,4-D: 2,4-D amine and 2,4-D ester. The amine is used in June and the first part of July, and the ester for the rest of the season, because the winds in June carry the ester to flowers, destroying them.

In 1948 the atomizer jets were discarded, because of damage to gardens. The vapour of 2,4-D ester discharged through these nozzles is too light. Amine salt of 2,4-D is used because its vapour is less harmful to gardens, although it is not so efficient as the ester formula.

Dosage

In May and June we use 2 quarts of 2,4-D amine in 100 gallons of water on poison ivy and 1½ quarts on ragweed.

In July, August and September, we vapourize a solution of 2½ quarts of 2,4-D ester in 100 gallons of water on poison ivy and 2 quarts on ragweed.

Nozzles and Pressure

The no. 59 nozzle was chosen to spray the chemical in a liquid form rather than as a mist, thus preventing any possible drift to neighbouring gardens. The pressure applied on the weeds may vary from 35 to 150 pounds, depending on various factors, such as the distance from the plants, the density of weeds, the presence of nearby gardens, the direction of the wind, etc. (3).

Control Method: "Pollen Collecting Stations"

To determine the effectiveness of the eradication program, it is important to follow the results from year to year. The method used should indicate the virulence or index number of hay fever, the number of days during which the ragweed pollen count remains above the border quantity that can be inhaled without danger; that is, 72 grains per cubic yard, according to the American Academy of Allergy. In short, we must make sure that the annual spraying of weeds results in a lower incidence of hay fever.

In 1947, 18 pollen-collection stations were established throughout the city, and gelatine-covered glass slides were exposed to capture pollen grains of ragweed for counting through the microscope. These glass slides are exposed every day, 24 hours a day, during August and September, and brought to our laboratory for identification and pollen counts. The pollen-catch devices were installed at fire stations because these stations are accessible to our inspectors at any hour of the day, including Saturdays and Sundays.

In 1947 and 1948 we had 18 stations throughout the City. In 1949 we reduced this number to 9, as we found that there was little difference between the counts from one station to the next. However, the number was again raised to 12 stations in 1953, in order to add sites well known to the general public—the Université de Montréal, the Mount Royal Chalet, and the Outremont City Centre. Even with this reduction from 18 to 12 pollen stations, the area of the City covered by each station is 4.3 square miles. This is a good standard, as the recommended maximum area for each station is 10 square miles.

In 1947 and 1948, the pollen-catch device used was the "Thomen", installed on window-sills. Since 1949 we have used two devices at each station: the Thomen device on window-sills and the Durham apparatus on the roofs. The use of these two apparatuses offers a means of comparison between readings obtained at roof level and at window level.

The pollen counts read at each station in 1947 and 1953 are shown in Figure 2.

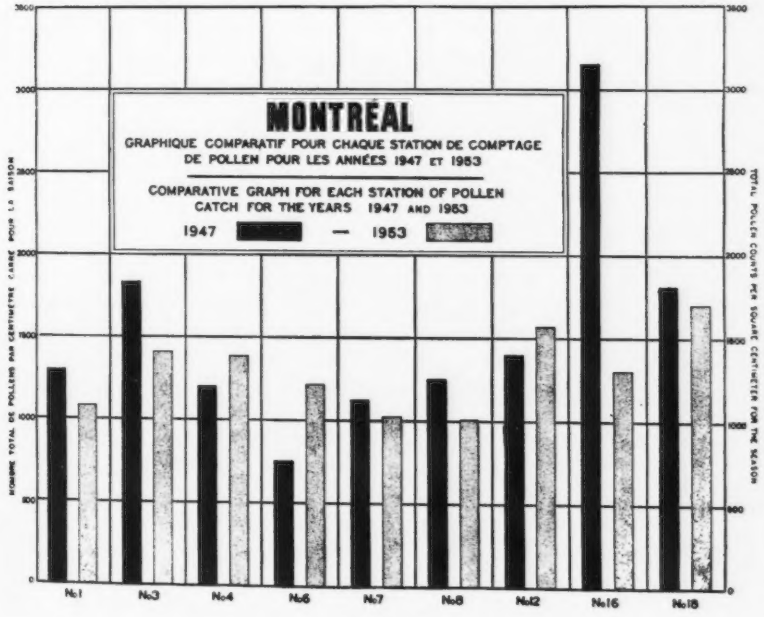

FIGURE 2

Statistics

In 1953 the total area covered was 906 acres. The chemical consumption was 238½ gallons of 2,4-D, or about one gallon per 3.8 acres. The sprayed areas included 5,433 private lots, or 458.4 acres; 1,476 curbs of sidewalks and streets, or 130.2 acres; 95 streets and lanes, or 10.3 acres; 529 yards and gardens, or 8.3 acres; 22 parks and school playgrounds, or 283.8 acres; and 15.0 acres representng land about which complaints had been received.

In referring to the annual reports of the Division of Sanitary Inspection of my Department, I notice that each year we have covered an area varying between 600 and 1,000 acres. In 1949 we covered 982 acres; in 1950, 625 acres; in 1951, 707 acres; in 1952, 620 acres; and in 1953, 906 acres.

The increase in the number of acres sprayed in 1953 is due to the fact that the spraying season has been extended to the month of October. However, the decrease noticed for the years 1949 to 1952, when the period of spraying was practically the same, is logical if we consider the decrease of infested areas.

On the other hand, the number of complaints coming from the public is increasing. This is due to the fact that people are now "ragweed-minded".

In 1949 the total number of complaints was 91; in 1952, it was 200 and in 1953, 118.

The increase in building construction of all kinds has greatly reduced the number of vacant lots.

During the summer of 1952 we found false ragweed growing along the railroad tracks of the St. Lawrence riverside. This false ragweed has been brought into the city from the western prairies by rail, with grain and other cereals from the West.

In 1947 the twenty-two municipalities of the Montreal metropolitan area were invited to co-operate with the City of Montreal in this campaign against weeds. A few of them have already joined our effort: Pointe-Claire, Outremont, Westmount, Montreal West, Hampstead, Mount Royal and Saint-Laurent. Last year Montreal East started to collect and count pollen grains during August and September. A similar invitation is being extended to the municipalities this year.

Conclusion

The problem of noxious weeds is definitely one of municipal interest, without neglecting Provincial jurisdiction and assistance. Any city of importance should consider this problem a social need and take the appropriate measures towards its solution by destroying the weeds within its limits. Moreover, a city is not likely to obtain the best results unless its campaign against weeds is developed outside its boundaries and made a more complete project embracing the whole metropolitan area.

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Poliomyelitis in the Yukon

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AND E. H. LOSSING, M.D.[3]

THE YUKON is a sparsely settled Territory in the north-west extremity of Canada. It extends into the Arctic, lying between 60° and 40°N. longitude and between 130 and 140°W. latitude (see map). To the north is the Arctic Ocean, to the west, Alaska, to the south, British Columbia, and to the east, the Northwest Territories. The capital city, Whitehorse, lies 1,369 miles by the Alaska Highway north-west of Edmonton. The most northerly settlement, Dawson City, lies 250 air miles farther north. The country is mountainous, with very little arable land, and is richly grown with poplar, spruce and jack pine of small size. It is drained to the north-west by many magnificent, rapidly flowing, navigable rivers, all of which ultimately join the Yukon, which empties into the Behring Sea. The climate is moderate in comparison to the Eastern Arctic and other parts of the earth of equal longitude. The annual mean temperatures for the past eleven years are as follows: 1942, 32.4; 1943, 33.2; 1944, 34.7; 1945, 31.0; 1946, 31.2; 1947, 32.7; 1948, 28.6; 1949, 30.8; 1950, 27.6; 1951, 28.3; and 1952, 31.4. The average monthly temperatures during the first five months of 1953 were: January, 13.9; February, 19.1; March, 16.5; April, 35.8; and May, 48.9. The monthly mean for the 10-year period was as follows: January, 1.5; February, 7.5; March, 19.1; April, 31.4; May, 45.9; June, 54.7; July, 57.3; August, 53.7; September, 46.4; October, 34.1; November, 16.3; and December, 4.8.

The People

Before 1898 the country contained only a few bands of Indians and Metis, who lived by fishing and trapping, and some widely spaced trading posts. Then came the gold strike on the Klondike River, which joins the Yukon at Dawson City. This was followed by the most noteworthy gold rush in Canadian history, which brought all conditions of men and women swarming down the waterways and overland. It is said that the population of Dawson City reached 25,000. Fabulous wealth was temporarily attained by a few; abject failure was the fate of most. The Klondike days have become a legend and a pensive memory to the oldtimers. Since then the Yukon history has been punctuated by strikes of gold, silver, lead, zinc and uraniums, and prospectors are always on the prowl. The only large operation at present is at Keno, 35 miles north-east of Mayo, where there is a settlement of 500 people, including miners and dependents.

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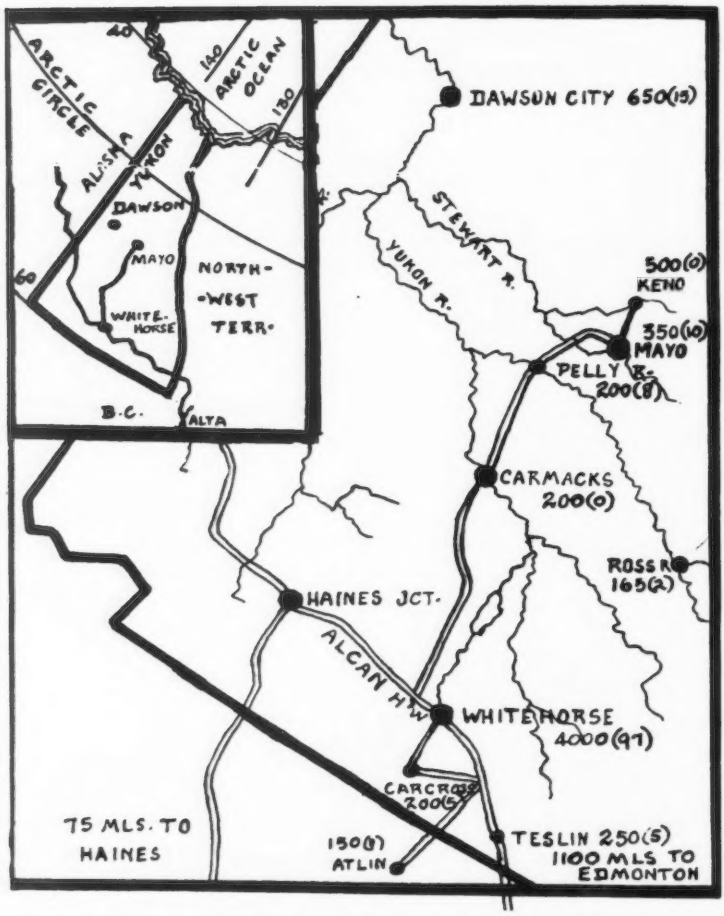
YUKON TERRITORY ★



★ SHOWING POPULATION (CASES IN PARENTHESES)

New life was instilled into the country with the building of the Alaska Highway by the American Army, which was begun in 1943. This extends from Dawson Creek, B.C. (450 miles north-west of Edmonton), to Fairbanks, Alaska, a distance of 1521 miles. Six hundred miles of the Highway traverses the Yukon Territory and requires the continuous employment of about one thousand men (Canadian troops and labourers).

The total population according to the 1951 census was 9,096 (male 5,457,

female 3,639), divided into the following groups (approximately): Indian, 1,700; Army (including dependents), 1,000; Air Force (including dependents), 1,100; civilian, 5,200.

Those listed here as "Indian" are recognized as such by the Federal Government; most of them are not "pure", nor do many live the primitive "bush life" of their ancestors. Many of the civilian population have some Indian blood and there is little difference between the mode of life and the occupation of the Metis and the Indians.

The actual number of Metis is not known, but would possibly be about 2,000. Among the 46 whites who contracted poliomyelitis, 22 were Metis. There are no Eskimos in the Territory.

The number of people in the Territory fluctuates and their distribution changes from season to season and from year to year. The Indian population is not on Reservations. The majority live in bands, each of which frequents a particular region, but many individuals travel about from place to place in search of game or manual labour. The Service personnel and their dependents change quite considerably from year to year. Labourers employed by the Air Force (200) and the Army (400) are largely a floating population. The static white, Indian and Metis population probably does not exceed 4,000.

In addition to the large fluid population in the Services, there are a great number of tourists mostly from the south-western States, in the summer. The majority of these are on their way to Alaska on the Alaska Highway. Also there is much air traffic into Whitehorse, Dawson and Mayo. Since there is only one narrow gauge railway (from Whitehorse to Skagway—200 miles) and the country produces no food, all the necessities of life must come in by the road or by air.

The Beginning of the Epidemic

Poliomyelitis is obviously not a new disease in the Yukon. In 1940 several cases occurred in Dawson City among Indians and whites. Three severely paralysed cases were well known in the community. In 1945 an Indian at Ross River had an acute illness which has left him with a flaccid lower limb. In the autumn of 1952 there were definite cases in the south-western part of Alaska; one white woman at Haines still has crippling paralysis. During the same season several cases from Northern British Columbia were examined in Whitehorse and suspected, but none is known to have developed paralysis; their records, which were examined, leave little doubt as to the diagnosis. In January 1953 an Indian woman (age 31) living in Whitehorse complained of weakness of the left arm and right leg. She was admitted to hospital but no diagnosis was made. We examined her on June 30, 1953, and found a typical poliomyelitis paralysis of the left hand and fore-arm, with about 50% loss of function. This woman stated that her six-year-old daughter had the same symptoms and weakness of the lower limbs. Examination of the child on June 30, 1953, showed no evidence of paralysis. It is apparent from this evidence and much more that could be given, that poliomyelitis has been smouldering among the permanent residents of the Territory for an indefinite period.

Epidemiological evidence that will be presented suggests that the younger members of the community have a relative immunity.

It was almost inevitable that the infection should have spread to the north in 1952. During the spring of that year there were epidemics in the south-western States from which tourists pour into the area; during the summer and autumn the four Western Provinces of Canada had record epidemics.

The first case diagnosed in the Yukon epidemic was in a 40-year-old Indian who, with two other adults from Ross River, had been trapping for some months along the Highway east of Whitehorse. He was brought to Whitehorse hospital, and died after a few days (April 2) with acute bulbar symptoms. His two companions returned to Ross River. Some weeks after, one of these, an Indian aged 65, died from what may have been bulbar paralysis, as judged by very graphic lay descriptions. It is a significant fact that no further cases occurred in the band at Ross River (165 strong) until July 4, when a male age 45 was flown into Whitehorse with bulbar respiratory and peripheral paralysis, from which he died.

The incidence of total reported cases, paralysis and deaths for each group are shown in Table I.

These figures do not represent the true incidence. The forces were under more direct medical supervision, and more minor cases were therefore reported. Medical service to civilians, and more particularly to Indians, was not so readily available, and only the more severe cases were discovered. This is shown by the high paralysis and death rates.

The course of the epidemic is shown in Figure 1. After the death of the first case (on April 2), referred to above, it was two weeks before cases began to appear among civilians in the town of Whitehorse. The epidemic proper began about the middle of April and continued until the first week of July. During the month of April four more cases were diagnosed among white civilians in Whitehorse. From then on cases increased among the white civilians at Whitehorse, reaching a peak of 13 cases in the last week of May and ending rather abruptly early in July. Early in the epidemic cases began to appear in a Church of England boarding school at Carcross—50 miles south of

TABLE I

DISTRIBUTION OF POLIOMYELITIS IN ARMY, AIR FORCE, INDIANS AND CIVILIANS, SHOWING TOTAL CASES, PARALYTIC CASES AND DEATHS

Population		Cases		Paralysis		Deaths	
		No.	%[1]	No.	%[2]	No.	%[1]
Army	1000	54	5.4	14	28	2	4
Air Force	1100	16	1.5	4	25	0	0
Indians	1700	24	1.4	10	41	4	17
Civilians	5200	48	0.9	26	56	3	6

[1]% of population.
[2]%of reported cases.

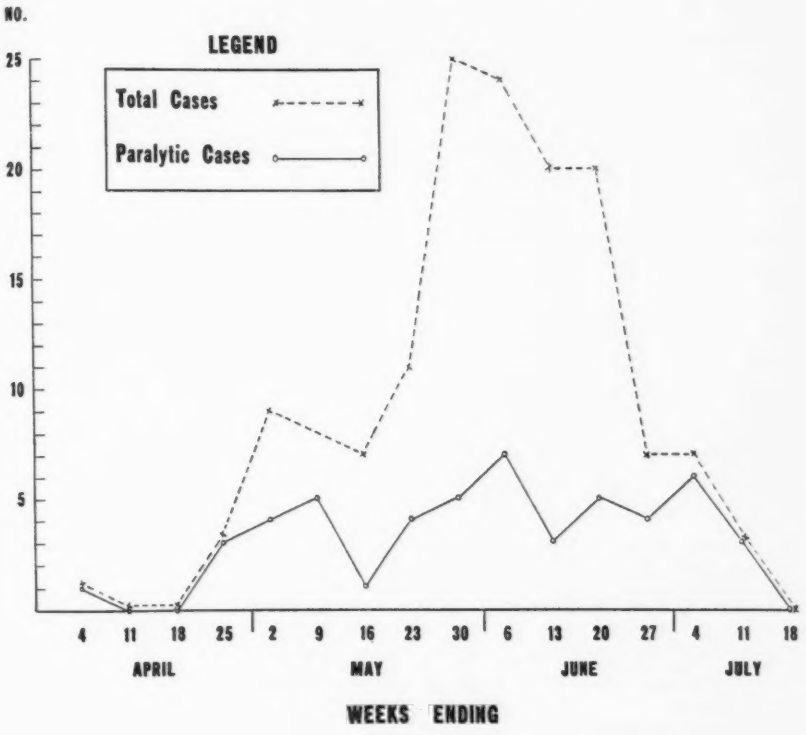


FIGURE 1

Whitehorse. During April and May there were 5 cases in the school (60 pupils) and one in the civilian population. In the third week (first week in May) the Army and their dependents in Whitehorse began to report cases; there were 54 cases, with the peak incidence in the last week in May and the last case in the last week of June. The Air Force fared better than the Army, having only 16 cases, 12 of which occurred in the 8th and 9th week. The Army and the Air Force, with their dependents, were of comparable strength (1,000 each) and age distribution; the lesser incidence in the Air Force may have been partly due to the fact that they have their quarters two miles distant from the main town, and intermixing with the civilian and Army population was discouraged early in the epidemic.

It is a significant fact that no Indian in Whitehorse developed the disease although 150 are resident and in summer many more are camped on the outskirts. The first Indian cases (after the original case from Ross River who

died on April 2) appeared in May at the Carcross school. In late May and June there were four Indian cases at Dawson, nine at Mayo, five at Pelly Crossing, one at Teslin and one at Atlin (in Northern British Columbia just south of the Yukon boundary).

All the bands infected live on the lines of communication (the Alaska Highway or the Territorial Highway from Whitehorse to Mayo). Although the band at Carmacks which escaped is close to the Mayo road, there is no white settlement at this point.

Age—Sex Incidence

There were 77 males and 65 females. Table II shows the age-sex distribution among Indians, civilians and the Services.

TABLE II

Distribution of Poliomyelitis Cases amongst Indians, Civilians and Armed Services by Age and Sex

Age	0–4		5–9		10–14		15–19		20–24		25–		
	M	F	M	F	M	F	M	F	M	F	M	F	Total
Indian	1	1	2	2	2	1	1	4	1	1	6	2	24
Civilian	10	3	3	1	6	1	0	1	3	3	5	12	48
Services	14	9	8	6	0	2	2	0	4	6	9	10	70
Total	25	13	13	9	8	4	3	5	8	10	20	24	142

The rate among Service personnel was more than three times greater than among civilians. This is partly accounted for by better discovery and notification in the forces and partly by the fact that they were concentrated in Whitehorse while many of the Indians and whites were in remote parts removed from intimate contact. Though the relative size of various civilian age groups is not accurately known, it is obvious that the children of Service personnel were most heavily affected. The small number of cases among Army and Air Force children between 10 and 19 is due to the fact that this group was relatively small. The percentages of age groups affected in various categories of the population (1951 census) are shown in Figure 2.

No epidemiological conclusions can be deduced from the age-incidence figures. The relatively large number of cases in the older age groups is striking; those over 20 were 41% in the Indians, 50% in the civilians (including Metis) and 41% in the Services. This is at least twice as high as what is usual in recent Canadian and American epidemics. It is largely or entirely due to the congregation of road workers (in and out of the Army and Air Force), transport workers and miners in the larger centres.

Sex Incidence

More than the usual preponderance of males in the age groups before puberty is seen (46 to 26). About the usual excess of females over males after puberty is found (31 to 39).

Reference has already been made to the unusual percentage in the older age groups.

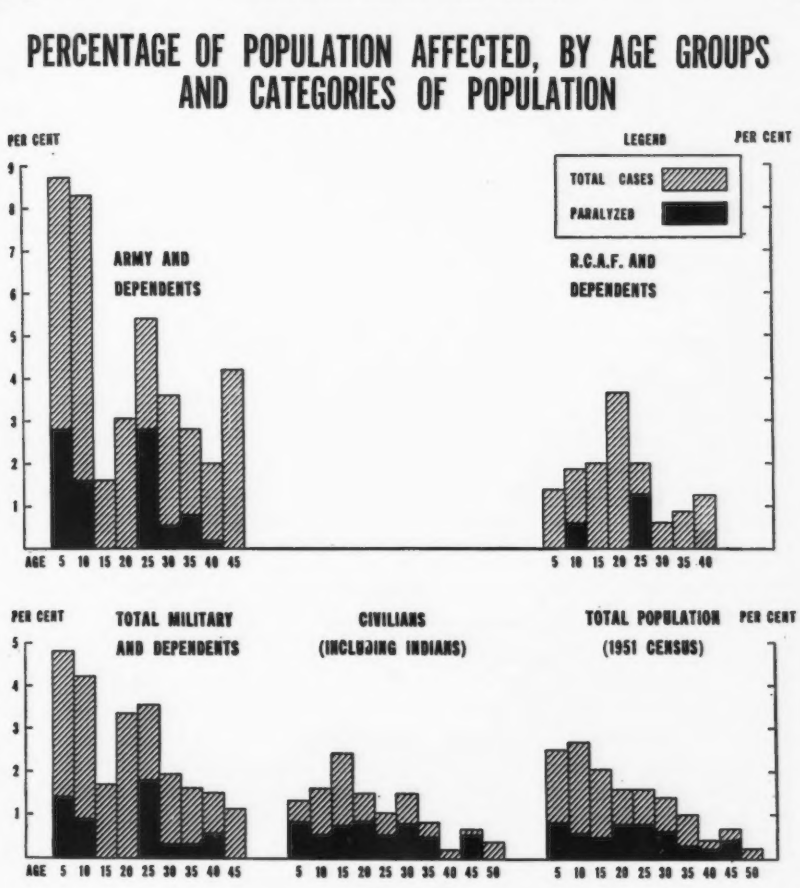


FIGURE 2

DEATHS

In the Forces the death rate (2 in 70 cases) was what is usual in other epidemics. In the Indians it was very high (17%), again suggesting that minor cases did not reach a doctor or were undiagnosed or not notified; departmental nurses to whom sick Indians appeal, give accounts of many definite cases which were never officially diagnosed or recorded.

There were nine deaths—6 males and 3 females. The age of those who died was unusually high—an average of 32. There was none under 24.

PARALYSIS

The paralytic rates were high except in the services. The widely different rates in the various groups is almost certainly due to the failure to discover or to report minor cases among Indians and civilians.

The unusually high attack, paralytic, and death rates per 100,000 are illustrated by Table III.

TABLE III

CASE, PARALYTIC, AND DEATH RATES PER 100,000, FROM POLIOMYELITIS, FOR VARIOUS GROUPS IN THE POPULATION

	Army and Dependents	R.C.A.F. and Dependents	Total Military and Dependents	Civilians Including Indians	Total Populations
Case	4,812	1,495	3,129	1,016	1,506
Paralytic	1,347	2,803	806	530	593
Death	192	0	95	85	88

TREATMENT

As in any unexpected epidemic, especially in remote parts, personnel and equipment was at first inadequate. The Forces were fortunate in having an excellent professional staff and were able to procure respirators. The Army brought in a competent physiotherapist who was of great assistance to all groups. The nurses whose untiring efforts in very difficult circumstances were most commendable, are deserving of recognition.

CONCLUSIONS

In a heterogeneous and fluid population of this sort it is difficult to come to any definite conclusions concerning the source and spread of the epidemic. The locale was unusual but by no means unique, several epidemics having occurred in or close to the Arctic Circle. The season also was earlier than usual. At the beginning of the epidemic summer had not well begun, although the spring had been unusually warm; 22 days in February, 20 days in March, 22 days in April and 20 days in May had been above the 10-year mean.

In so far as the Forces were concerned, the epidemic ran about the same course as one would have anticipated in any other location. It seems likely that the Indians and Metis are no more susceptible than the whites. The infection was well established in the Indian school at Carcross, but only four out of 60 pupils were ill, and none died and only one had severe paralysis. In the centre of the town of Whitehorse an Indian school of 140 pupils escaped with no cases. It would seem therefore from the general low incidence among the younger Indians and Metis that they have a relative immunity. All this is in striking contrast to what occurred among the Eskimos at Chesterfield in 1949. It is of interest, however, that poliomyelitis virus Type I (Brunhilde) was isolated from a number of stool specimens from Whitehorse to Dawson. This is the same type of poliomyelitis which was isolated at Chesterfield Inlet, and which has currently been found during epidemics in Canada during recent years.

ACKNOWLEDGEMENTS

The authors wish to thank Col. E. J. Young, Command Medical Officer, Western Command, Edmonton, the R.C.A.F. Medical Services, and Miss J. I. Driver for valuable assistance and contributions during this epidemic. The assistance of Dr. Andrew J. Rhodes, Hospital for Sick Children, Toronto, and Mrs. D. Duncan in the typing of the polio virus is also acknowledged.

The Isolation of Coxsackie Virus from Cases of Pleurodynia in Canada

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PLEURODYNIA or muscular rheumatism in the chest was the designation used by Finsen in 1874 (14) to describe a short-term febrile illness in which the chief symptom was pain accompanying respiratory movement. Detailed clinical accounts of the epidemic form, Bornholm disease or epidemic myalgia, are numerous (4, 5, 6, 11, 15) and the clinical features are well recognized. In recent years Coxsackie virus, Group B, has been considered to be the most likely aetiological agent and reports of its association with the disease have come from several countries (3, 7, 10, 13). As yet, there have been no reports of the isolation of this virus from naturally occurring cases in Canada. The following is an account of the investigation of six cases of sporadic pleurodynia which were encountered during epidemiological studies in the summer of 1953 in Ontario.

Clinical Investigation

A total of 90 patients were referred as possibly suffering from conditions due to Coxsackie infection. Thirty-three of these were diagnosed as non-paralytic poliomyelitis, 16 as herpangina, 6 as epidemic pleurodynia, and 11 as a variety of other conditions; the remainder constituted two separate outbreaks of pyrexial condition of unknown origin. Coxsackie virus was recovered only from the herpangina patients (8 isolations of Group A virus) and the pleurodynia patients (2 isolations of Group B virus and 1 of Group A). A detailed description of the pleurodynia cases is now given.

The first two patients investigated were brothers (D. R. and B. R.) residing in the northern part of Toronto. The illness began in this family with the youngest of the five children, a boy of 2 years, who on September 7th and 8th experienced several 8–10 minute attacks of severe apparently abdominal pain manifested by screaming and a doubled-up posture. Physical examination yielded no positive signs. His two brothers, 11 and 20 years of age, became ill 3–4 days later with headache aggravated by movement of the head or body, anorexia, nausea, fever and stabbing chest pain. This pain was always incurred by deep breathing, made ordinary breathing difficult and was unrelieved by aspirin. Chest examination of both boys failed to reveal any abnormalities. The pain with the other symptoms gradually tapered off over the next 3–5 days but full health was not regained for 7–10 days. Two other brothers, one of whom slept with the 11-year old boy, remained symptom-free, as did the

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parents. The fifth boy was a contact only during the convalescent stage of the disease.

Specimens were obtained also from a 22-year-old woman (N. H.) living in a town 70 miles west of Toronto. Her illness began with sharp stabbing pain just above the left costal margin. It was episodic in character but always made apparent or worse by coughing or deep breathing. It was not associated with any other symptom. Six days after onset, the pain suddenly became much worse so that the patient was unable to lie down or sleep. While aggravated by deep breathing and movement, it was present, severe and stabbing, even with short controlled breaths. A propped-up posture greatly relieved her distress. Physical examination at this time revealed decreased movement of the left side of the chest and a tenderness to deep pressure over the area of the pain. Breath sounds were normal and there were no adventitious sounds or friction rub. The pain persisted, though gradually decreasing in severity over the following 14 days, and thereafter moved to the midlumbar area for 2 days and to her right wrist for 1 day. Her sister's children, for whom she cared daily, had no illnesses during this period.

The other two cases, both women in their thirties, one living in the western part of Toronto, the other 90 miles to the east, had similar features of fatigue, malaise and spasmodic chest pain made worse with deep breathing. However, both were seen in the second week of their illness, too late for satisfactory virological studies. None of the cases described relapsed, and no further cases in the districts involved were known.

Materials and Methods

Collection of specimens, virus isolations and tests for antibody in the patients' sera followed the methods employed by Wood et al. (16)

Virus Typing. For the determination of serological type, immune mouse or hamster antisera to Dalldorf's types A1–10 and types B1–4 were used. Equal volumes of undiluted mouse or hamster immune serum were mixed with challenge material containing 100 LD_{50} of virus. After one hour the serum-virus mixtures were inoculated intracerebrally into families of 2-day-old suckling mice, which were observed for a period of 28 days.

Laboratory Results

Virus Isolations:

Two strains which produced the typical illness and histological picture of Coxsackie Group B virus in suckling mice were isolated from the stools of the brothers D. R. and B. R. The specimens were taken on the 3rd and 4th days of illness. Neither of the strains isolated were neutralized by standard types B1, 2, 3, or 4 antisera.

A typical Group A strain was recovered from a specimen of stool from patient N. H. taken on the 7th day of illness. This strain typed in a clear-cut fashion as A6 with specific immune sera. The treated stool specimen was also mixed with type A6 antiserum and inoculated into a further batch of mice in an attempt to demonstrate the presence of other Coxsackie viruses, particularly of the B Group. No other type of virus was recovered.

Antibody Response

Increases in antibody titres as measured by serum neutralization tests were detected in the patients' sera during the course of the illness. In Table I is shown the increased protective effect of convalescent serum against the B strain isolated from the patient. It was possible with patient D. R. to measure the difference in neutralization titre, and a logarithmic difference of 1.7 calculated by the Kärber method was found.

TABLE I

ANTIBODY RESPONSE IN PATIENTS FROM WHOM GROUP B VIRUS WAS ISOLATED

Patient	Virus used as challenge Dose 100–1000 LD_{50}	Serum Specimen	Mortalities with serum-virus mixture Serum dilutions				
			Undil.	10^{-1}	10^{-2}	10^{-3}	10^{-4}
D. R.	Strain from Patient D. R.	Acute	3/8	5/8	9/9	N.T.	N.T.
		Convalescent	N.T.	1/8	3/8	7/9	8/8
B. R.	Strain from Patient B. R.	Acute	1/8	4/8	6/8	N.T.	N.T.
		Convalescent	N.T.	0/8	3/8	8/8	8/8

N.T. = Not tested.

In order to assess the significance of the isolation of an A type virus from patient N. H., it was decided to test the acute and convalescent sera from this patient not only against the A6 strain isolated but also against the standard A6 strain and the standard B types available. In Table II the protective effect of the acute convalescent sera for these various strains is shown. Two facts are observed. Firstly, there is an increase in antibody to the strain isolated and the corresponding type strain A6, and, secondly, there is a high level of antibody to type B4 virus both in the acute and convalescent specimens. It should be noted that the early phase serum was not obtained until the seventh day after onset.

DISCUSSION

Strong evidence for the association of Group B Coxsackie virus with outbreaks of epidemic pleurodynia or Bornholm disease has accumulated during the past five years and even the occurrence of laboratory infections has been reported (12). Perhaps the strongest piece of epidemiological evidence has been the finding of a specific type, B3, as a probable causal agent in the summer of 1951 in countries as far apart as the United States, Britain, and Australia (2). Lazarus reported the same type as responsible for an outbreak in Washington State the year previously (1950) (9). This was the first occasion upon which type B3 had been associated with Bornholm disease. That the disease is not associated with one particular type of Coxsackie B virus is well recognized; the first strain isolated was a type B1 (1), and type B4 was reported as the agent responsible for an outbreak in the summer of 1952 in the Transvaal (10). It is not surprising, therefore, that the type B strains recovered by us from two

TABLE II

ANTIBODY RESPONSE IN PATIENT (N. H.) FROM WHOM TYPE A6 VIRUS WAS ISOLATED

Virus used as challenge Dose 100–1000 LD_{50}	Serum Specimens#	Mortalities with serum-virus mixtures Serum Dilutions		
		10^{-1}	10^{-2}	10^{-3}
Strain from N. H.	Acute	1/9	7/9	N. T.
	Convalescent	0/9	2/9	9/9
Type A6	Acute	0/9	9/9	N. T.
	Convalescent	0/9	5/9	9/9
Type B1	Acute	5/9	9/9	9/9
	Convalescent	6/8	8/8	8/8
Type B2	Acute	8/8	8/8	9/9
	Convalescent	9/9	9/9	9/9
Type B3	Acute	2/9	9/9	9/9
	Convalescent	3/8	8/8	8/8
Type B4	Acute	0/9	0/9	1/9
	Convalescent	0/9	1/9	3/9

#—Acute specimen taken 7 days after onset;
convalescent specimen taken 27 days after onset.
N.T.—Not tested.

sporadic cases, during a period when Coxsackie infection was not widespread, did not correspond to one of the recognized types.

The primary isolation of a Group A Coxsackie virus from one of the cases described and the concurrent rise in antibody to it indicates the difficulties which may arise in the laboratory diagnosis of sporadic infections. The serologic findings apart from the foregoing showed a sufficiently high neutralizing titre to type B4 to make one suspect a recent infection with the latter. There is no proof of this, as we failed to isolate a second strain of virus from this patient. There was nothing in the history of the patient to suggest a recent illness prior to the one under investigation. Isolation of Group A virus from cases of pleurodynia even in the presence of a rise in antibody titre, has on occasion been dismissed as concurrent infection owing to the occurrence of Group A in healthy individuals (8); however, this was when the disease was epidemic and Group B virus was isolated from the majority of cases investigated. When confronted with the same problem in a sporadic case, more knowledge is required concerning the distribution of the types concerned in the normal population. In the particular case under discussion it can be said that during the season relatively few Group A strains were isolated, even from patients suspected of suffering from Coxsackie infections, and, therefore, one would not expect the carrier rate to be high. Furthermore, antibody rise was demonstrated for type A6. However, we know of no instance of type A6 being specifically connected with Bornholm infection although type B4 has been associated with this disease. In children type A6, amongst others, has been held responsible for herpangina; the patient in question did have children under her care, but there was no history of illness amongst them.

Summary

An account has been given of 6 sporadic cases of pleurodynia encountered in the summer of 1953. Coxsackie virus of a B type which was not neutralized by Dalldorf's types B1, 2, 3, or 4 antisera, was isolated from two of the cases and specific rises in antibody were found during convalescence. From a third patient Coxsackie virus type A6 was recovered and a serum antibody rise to it obtained. In the latter patient a high level of antibody to type B4 was noted in both the early and late specimens of blood, although this virus could not be isolated from the stool even in suckling mice protected against the A6 strain.

ACKNOWLEDGMENTS

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The Recalcitrant Tuberculosis Patient

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IN the Province of Nova Scotia, the Divisional Medical Health Officer is required to conduct a generalized public health program. Pulmonary tuberculosis has been and still is one of our major public health problems. For this reason, each Divisional Health Officer has been specially trained in this field, so that he can conduct chest clinics and interpret chest films. In some of our Divisions he is required to supervise treatment in the Tuberculosis Units which are associated with a number of our general hospitals. Furthermore, the Divisional Officer is charged with the responsibility of authorizing all admissions to the Provincial Sanatoria.

Prior to 1948, the demand for beds to treat active cases of pulmonary tuberculosis usually exceeded our total bed capacity. For this reason, persons with open tuberculosis who left our institutions against medical advice or who refused admission, could always be replaced with other patients who were willing and eager to obtain the treatment they required. Because of these circumstances, the problem of recalcitrance was not a pressing one, although it did give rise to considerable concern.

By 1948 we had two new hospitals for treating pulmonary tuberculosis. These additional facilities solved many of our problems and at the same time pushed the problem of the recalcitrant patient into the foreground. No longer could we put this group at the bottom of a long admission list and forget about them until they slowly emerged again at the top of the list.

In hospital, the recalcitrant patient presents a multitude of problems which usually follow the same pattern: he has little regard for regulations, it is rarely possible to please or satisfy him, and he usually exerts a disturbing influence on other patients. In time he creates a situation that cannot be resolved, and either he leaves against advice or he has to be discharged against advice, to preserve the sanity of the Superintendent and some semblance of order in the institution.

While I do not wish to minimize the problems of hospital authorities who make an honest effort to cope with this type of patient, I have good reason to be convinced that their problems are minor ones in comparison with the problems of such an individual once he is out of an institution.

The type of person who has open pulmonary tuberculosis and refuses to be admitted to or to remain in an institution is usually a person who has little or

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no regard for his own welfare nor for the welfare of his family or any of his associates or contacts in his community. In our experience, we have found that the majority of our problem individuals who became categorized as recalcitrants, were either psychopathic personality types or alcoholics. For some reason, many of the recalcitrants boasted about their successful defiance of public health authority. This invariably stirred up considerable public criticism, which was fully justified but nevertheless very embarrassing.

Another common trait of the recalcitrant we often observed, was their social activity which gave them far more opportunity to spread their disease than the average patient at large would have. If there was a beer tavern, a dance or a social gathering in their community, they would invariably be in attendance.

For these reasons, the recalcitrant is a thorn in the flesh of the Health Officer as well as a liability to the tuberculosis control program.

To deal effectively with this problem, our Provincial Public Health Act was amended in 1948. The new sections* which were added to our Health Act enabled us to take action against any person who . . .

"(a) is suffering from open tuberculosis; and

"(b) is unwilling or unable to conduct himself in such manner as not to expose other persons to danger of infection; and

"(c) refuses to be admitted to, or remain in, a sanatorium or hospital or has left a sanatorium or hospital against the advice of the Superintendent thereof."

If the evidence contained in the information can be proved to the satisfaction of the magistrate before whom the case is tried, the defendant can be detained by court order in one of our Provincial Sanatoria for a period up to one year.

Another section of the 1948 amendment empowers the Medical Health Officer who believes a person may be suffering from open tuberculosis to serve a written notice signed by him and a Divisional Medical Health Officer, specifying the nature, time and place of examination. This section is very helpful; in some cases it is the only way information leading to commitment can be obtained.

We have never taken any action under these sections of our Public Health Act without carefully weighing the evidence and making reasonably certain that the individual was given a square deal. If a person leaves or is discharged from one of our institutions, he is given a second chance and sometimes a third chance before an action is taken against him. Sometimes a patient may be classified as recalcitrant in one institution when the fault is not entirely his own and when transferred to another institution he is found to be a reasonably good patient.

Once the decision is made that court action is the only method by which a difficult individual can be handled, then it is usually a simple matter to obtain a conviction, provided your evidence is in order. In the past five years I have brought cases before five different magistrates without experiencing any difficulty. On several occasions the defendent pleaded not guilty and demanded

*The Public Health Act, Province of Nova Scotia, Chap. IV, Part II, Sections 127 to 141.

the privilege of a retrial with legal assistance. This did not add any appreciable difficulty to securing a conviction. Once a conviction is obtained, the patient is escorted to the designated sanatorium. On admission they are told that they will receive the same treatment and the same privileges in the institution that voluntary patients do, provided they are willing to co-operate and to conduct themselves in a reasonable fashion.

It has been our experience that some of our court-order cases give little or no trouble when admitted. Many of them realize that they have nothing to lose and much to gain by co-operating. On the other hand, many of the psychopathic personality cases and the alcoholics that we have to commit to our tuberculosis institutions present behaviour problems that demand disciplinary action. In such cases, it is necessary to transfer them to detention quarters. Later they are given a chance to return to the general ward whenever there is sufficient improvement in their behaviour.

There is no doubt in my mind that a suitable detention annex is an essential part of our plan to cope with this perplexing and serious public health problem. It is easy enough to commit a person to an institution, but it is not easy and often not possible to care for some of these patients in the general wards.

It is not possible to assess the value of compulsory hospitalization for open cases to our tuberculosis program. My own feeling is that these "new teeth" in our Public Health Act have already made a worth-while contribution to our efforts in this field of public health.

In my limited experience, I can recall a number of households in which open recalcitrant cases of tuberculosis continued to live previous to the time we had compulsory legislation. Their complete indifference to their own welfare and to the welfare of those persons with whom they associated, was, to say the least, appalling. Anyone who has seen new cases of active tuberculosis cropping up in such families, and anyone who has seen infants from such families develop tuberculous meningitis and other equally serious complications, will, I am sure, agree that such negligence must be considered criminal.

Summary

This paper is a brief résumé of the various problems encountered in dealing with recalcitrant individuals who have open tuberculosis and our experience in the Province of Nova Scotia in dealing with such persons under appropriate legislation, which was enacted in 1948 to fill a gap which existed in our tuberculosis control program. Our experience with this legislation during the past six years has indicated that compulsion is not only a necessary control measure but is also a measure which has been well received by the general public.

Recent International Developments in Vital and Health Statistics

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THE interest of Canadian health statisticians in developments and activities at the international level is by no means merely a matter of casually keeping abreast of what is going on in the general field of health statistics. On the contrary, there are important compelling reasons for us to keep in close touch with these happenings and, if possible, to know something about them before they actually take place.

One such reason is illustrated by the term "international comparability", which merely means that the maximum usefulness of Canadian health statistics lies in being able to compare Canada's health status and progress with the similar experience of other countries. Actually, the setting up of standards to ensure comparability is of more than international application; behind many of our national statistical data are standard procedures, terms, definitions and rates, which have been worked out internationally but which have achieved accepted usage in national practice. Changes in these standards can and do affect the comparability of our local statistical series from one year to another. For this reason alone, a country can hardly afford not to know what developments are taking place or what changes are under contemplation internationally.

Of a more positive nature, there is the advantage to be derived by individual countries as a result of bringing together, at the international level, groups of authorities and experts from a variety of different countries for discussion of common problems in health statistics. In this way, the most recent knowledge and experience concerning new concepts and new techniques is made immediately available for sharing by all countries.

In the fairly large family of international agencies there are many which make routine use of vital and health statistics in the programs of social and economic development which the United Nations has undertaken. Among these one would include the Food and Agricultural Organization, the International Labour Organization, and the United Nations Educational, Scientific and Cultural Organization, as well as the subsidiary commissions of the Economic and Social Council such as the Population Commission and Statistical Commission. However, the two which are most directly involved, having in a sense a proprietary interest in the quality of health statistics, are the

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World Health Organization and the Statistical Office of the Secretariat of the United Nations. It is these two with whom national officials have most contact.

The Statistical Office of the United Nations occupies the same sort of position internationally as the Dominion Bureau of Statistics does for Canada. Located in New York, it operates a centralized statistical service for the various United Nations bodies, and publishes monthly, quarterly and annual statistics of world population, production, trade, transport and similar subjects. In addition, it exercises certain responsibilities in improving international comparability, developing international statistical standards, and helping directly in the improvement of national statistics. In recent years, the Statistical Office has made a number of notable contributions to the advancement of vital and health statistics, its efforts being directed most strongly toward countries which have not yet reached a very high level of statistical development. It has provided visiting experts to train national staffs and to set up national vital statistics systems. It has convened special training institutes and seminars in various parts of the world, including the organization of a long-term biostatistics centre in Chile to train statisticians from Latin-American countries. It has awarded a number of fellowships to promising statisticians from underdeveloped countries to secure academic and service training in other countries.

Although we in Canada may not have profited directly from these training programs, we have undoubtedly benefited in other ways. We have learned a good deal by noting the particular aspects of health statistics which have received greatest emphasis in the operational and training programs of the Statistical Office. We have acquired some useful ideas by observing the arrangement and layout of statistical data in publications like the Demographic Year Book of the United Nations. We have been able to evaluate our registration and statistical procedures in the light of the standards outlined in the recent special report on the Principles of a Vital Statistics System.

The second international agency directly concerned with vital and health statistics is the World Health Organization, which is dedicated to the attainment of the highest possible level of health for all the peoples of the world. The World Health Organization is one of the specialized agencies of the United Nations, and has liaison with the General Assembly of UN through the Economic and Social Council and the Secretariat of the United Nations. Basically the difference between the two agencies can perhaps be summed up by saying that the Statistical Office is the central international source of a wide variety of statistical information, which includes vital statistics as part of a broad range of demographic data. WHO, on the other hand, has a more specialized interest in statistics needed for the assessment of health status and the study of health problems by medical and public health personnel.

In reviewing the actual developments which have taken place under the auspices of the WHO, an appropriate starting point is the International Revision Conference which was held in Paris in 1948. The primary purpose of the Conference was to secure national agreement on the 6th Revision of the International List of Causes of Death. In addition to completing this task with great success, the Conference also turned its attention to methods of improving

the general level of vital and health statistics throughout the world. Its discussions led to a number of recommendations which have had far-reaching consequences in the past six years and which have, in effect, determined most of the developments which have actually taken place during that time. Two of the recommendations, in particular, have been directly responsible for the pattern of national-international liaison in health statistics and for the much wider involvement of individual countries in international developments.

In response to one of these recommendations, the World Health Organization established an Expert Committee on Health Statistics with broad authority to study statistical problems in the field of health, including those connected with the registration of births, diseases and deaths. In its membership and procedures, the Expert Committee follows the standard pattern of a number of other Expert Committees established by WHO to provide technical advice on particular subjects, including malaria, mental health, nutrition, nursing, health education and many others. The members of the Expert Committee serve in their personal capacity and not as representatives of any government or organization. They are selected by the Director General on the basis of technical knowledge and experience, with due regard to geographical representation. The conclusions reached by the Committee are not binding on the World Health Organization but are transmitted, through the Organization, to the World Health Assembly, where their recommendations may be adopted or rejected. The findings of all Expert Committees, including the Expert Committee on Health Statistics, become public information through publication in a series of technical reports issued periodically by the World Health Organization.

The second important recommendation of the Revision Conference to influence recent developments was that all governments establish National Committees on Vital and Health Statistics to "study broadly the problems of producing satisfactory national and international statistics in the field of health". This machinery of national action and international cooperation visualized that studies of statistical problems would be decentralized to interested national committees and that the results of national study would be transmitted to the Expert Committee. The Conference amplified this general recommendation by specifying particular studies for action by individual countries. For example, it was recommended "that competent authorities of Canada and the United States of America prepare an adaptation of the International Classification to the needs of the Armed Services". Another recommended "that the Vital Statistics Administrations of Switzerland, the United Kingdom and the United States study methods of presentation of statistics of multiple causes of death". Finally, it was recommended that these national committees report their findings and recommendations from time to time to the Expert Committee on Health Statistics for international consideration, clearance of national viewpoints and coordination of the statistical interests of other inter-governmental organizations.

These two developments—the creation of an Expert Committee on Health Statistics at the international level, and the setting up of national committees or their equivalent in approximately 30 countries—have been responsible for

most of the international developments since. Together they have provided a mechanism for a two-way flow of information, experience and ideas, which bridges the gap between the broadest world interest and the most specialized local outlook. The countries themselves derive major advantages from the arrangement in two important ways. Firstly, national viewpoints and preferences are adequately represented in international definitions and standards and, secondly, the building up of vital and health statistics systems in backward countries is developed along lines which conform to a majority of world opinion as to what are good practices and principles and what are not.

The actual developments resulting from the mechanism are reflected in the reports of the three sessions which the Expert Committee has held since 1948. The first session was held in Geneva in May, 1949. The first item on the agenda was a discussion of National Committees on Vital and Health Statistics. On this subject the Expert Committee recommended

—that the secretariat issue an informative document setting out the motives and background of the establishment of national committees;

—that a focal unit be set up in the secretariat to provide a consulting and exchange service for national committees;

—that WHO initiate an international conference of representatives of national committees.

On the subject of certification and classification of causes of death, the Committee recommended that WHO

—prepare a booklet elaborating and illustrating the provisions of the Manual of the International Statistical Classification;

—set up in its secretariat a clearing centre for problems arising in the application of the classification.

In three special areas of health statistics the Expert Committee, at this first session, suggested that subcommittees be designated for further study of particular problems in hospital statistics, cancer statistics, and an international definition of stillbirth. Other matters upon which the first session passed recommendations related to the publication of epidemiological and vital statistics, the importance of health statistics in underdeveloped areas, the teaching of health statistics and the training of health statistical personnel.

A number of the recommendations passed at this first session of the Expert Committee have since borne fruit. An international clearing centre on classification problems has been set up in London, England, in cooperation with the General Register Office of England and Wales. The clearing centre has given rulings on a number of controversial points encountered in coding deaths in various countries, and has issued several supplements to the Manual of the International Classification dealing with medical certification, comparability between the 5th and 6th Revisions of the International List, and supplementary interpretations and instructions for coding causes of death. The clearing centre has also carried out the important function of acting as an international focal point to preserve continuity between decennial revisions of the International List.

The subcommittees suggested were approved by the World Health Assembly and subsequently brought in reports for presentation to the Expert Com-

mittee at its second session, which was held in April, 1950, in Geneva. At the second session the Expert Committee reviewed the reports of the three subcommittees and abstracted certain of their findings for national and international action. The proposed definitions of stillbirth and abortion were adopted and were subsequently approved by the World Health Assembly and have since been transmitted to member nations for implementation in their national statistics. A number of the other conclusions reached by the subcommittees were also approved by the Expert Committee and were suggested directly for study to national committees. These included certain problems in the field of *foetal and infant mortality*, with particular emphasis on the definition of immaturity and the classification of multiple causes of foetal death. In the field of *cancer statistics*, national committees were invited to study difficulties arising in the application of the International Classification in classifying neoplasms, the accuracy of diagnostic information on death certificates, and the relationship between cancer mortality and social and environmental factors. In the field of *hospital statistics*, the Expert Committee suggested national study of eight specific items, including the formulation of definitions of hospital terms and the collection of statistics on hospitals and hospitalized mental illness and tuberculosis.

At the same session, the Expert Committee also devoted attention to the growing importance of obtaining some statistical measurement of morbidity. The scope and complexity of the problems which would have to be faced in working out statistical procedures relating to morbidity were evidently too great to be handled by a small international committee, so it was recommended that the next session of the Expert Committee should include a number of additional co-opted members in order to obtain a proper evaluation of the problems requiring international action in developing morbidity statistics.

This last recommendation was carried out at the third session which was held in Geneva in November, 1951. The sessions were held in two parts, the first representing an international conference on morbidity statistics with greatly widened membership of the Committee, followed by a regular session of the original Expert Committee. The Morbidity Conference discussed the various types and uses of morbidity statistics in countries at various stages of statistical development and worked out a comprehensive scheme in tabular form which could be used as a type of blueprint for the gradual development and extension of various kinds of morbidity statistics. It also urged further national activity in the direction of standardizing the definitions and terms to be used in measuring morbidity.

The second part of the session, attended by members of the regular Expert Committee, reviewed the developments which had taken place since 1948 in the application of the International Statistical Classification. Its most important recommendation in this connection dealt with future revisions of the International List. The Committee recommended that the timing for decennial revisions be changed so as to take place at the mid-point of each decade rather than at the end. The object of this change was to allow countries to acquire several years' experience in the use of the classification before undertaking special mortality studies related to population censuses, which are usually

taken in the years beginning with "0" or "1". This change in the time-cycle of the decennial revisions means that the 7th revision will take place next year, five years after the 6th revision was actually put into use by most countries. In that five years, many of the problems associated with a new classification have been overcome, but the Expert Committee has felt that in so short a time not enough national experience has been accumulated to warrant a full-scale revision of the whole classification. It was accordingly recommended that the 1955 revision should be limited to the correction of errors and inconsistencies which have already come to light and to the most essential changes required to make the list more useful without altering its basic structure.

These recommendations have subsequently been approved by the World Assembly and the machinery for the next revision has now been set in motion. It is proposed that the revision will actually take place in 1955, with the idea that individual countries can put the revised classification into effect in 1956 or 1957. The international preparatory work has been commenced partly through the continuing work of the clearing centre in London and partly through an advisory group on the classification of diseases which met in London in February last. This advisory group has formulated specific proposals for revision of the Tabular List of the International Classification within the limited framework recommended by the Expert Committee. The World Health Organization will transmit these proposals to its member nations, including Canada, within the next few months. Each country will be invited to secure a clearance of domestic viewpoints on the proposed revision and to submit its recommendations and counter-proposals to the WHO. The national recommendations will in turn be presented to the Advisory Group during the coming fall and its task will be to modify the original proposals in the light of the various national submissions. In doing so the Advisory Group, which will actually be a meeting of the Expert Committee, will prepare the basic document which will go back to individual countries as the documentation for a formal International Revision Conference expected to be held early in 1955 and at which various countries will be individually represented by official delegates. The conclusions reached by the International Conference are expected to be presented for formal ratification by the World Health Assembly at its regular annual meeting about May, 1955. Approval by the Assembly would then permit the Revision to be submitted to each member nation for implementation from the beginning of 1956.

At the third session, at which the decisions regarding the next revision were made, the Expert Committee also reaffirmed its previous recommendation concerning the holding of an international conference of representatives of National Committees. With the approval of the World Health Assembly, this conference was held in London in November last. Twenty-eight countries were represented, as well as appropriate international agencies and the International Statistical Institute. While no report has yet been received for publication, it can be said that the conference was extremely successful. It reviewed the objectives, organizational patterns and activities of national committees, and made a number of specific recommendations as to the ways in which national

committees could operate most effectively in countries at various stages of development in order to bring about improvement in the quality of vital and health statistics in these countries. In addition, the conference discussed a number of specific methods of improving the quality of health statistics and passed recommendations on such subjects as the use of sampling techniques, the problems of confidentiality of medical records, the improvement of certification of causes of death, and a number of similar measures.

In looking back at all these developments from the vantage point of six years later, it would be difficult to single out any one of them for special mention. It does seem, however, that if one were asked to say what single event has made the most significant contribution to raising the level of vital and health statistics throughout the world, the answer would have to be the actual adoption of the 6th revision itself. In the relatively short space of time since 1950 the new classification has not only become a live force in the national vital statistics of many countries of the world, but it has penetrated, on its own merits, into many specialized areas of health statistics, until today it is widely and firmly entrenched in morbidity statistics, in hospital and medical care plans and in special mortality studies in a large number of individual countries.

The tremendous success of the 6th revision and the way in which it has grown into daily practical use on a world-wide scale should be a matter of particular pride to those countries and individuals who were involved in the laborious preliminary work on the classification in the years leading up to 1948. It is a matter of record that Canada was prominently identified with these preliminary efforts, and to a very large extent the voice of Canada was the voice of members of the Canadian Public Health Association. It seems fitting that at this present meeting in Quebec City acknowledgement should be made of the fact that it was also here just seven years ago that the Section established its Committee on Nomenclature and Nosology, whose members made such a worthwhile contribution to the Revision Conference which was held in the following year.

In considering what future developments lie ahead, and what part Canada may be expected to play in these technical international activities in health statistics, two main questions arise. One is the question of whether the types of problem which are being suggested by WHO for national study and action are really those which are most likely to develop and improve vital statistics systems and basic health statistics series in countries throughout the world. Special studies in morbidity and mortality are undoubtedly of great importance to countries like Canada and the United States, but seem to offer doubtful advantages to underdeveloped countries where the greatest need is for practical assistance in developing the administrative and legislative structures which are fundamental to any national statistical system. If this sort of universal upgrading is the primary objective of international statistical activity, then perhaps some redirection of emphasis may be needed which will give stronger weight to the requirements of backward countries.

The second question is what kind of mechanism we need to have in Canada which will give the most effective and most widespread representation in inter-

national developments. This liaison function is at present carried out through Canada's national committee, the Medical Advisory Committee to the Dominion Statistician, which also has the function of advising the Dominion Bureau of Statistics on current and future policy in the gradual development and improvement of national vital and health statistics. Members of the Committee represent various jurisdictions rather than specialties or disciplines, and the Committee undertakes no actual work itself but assigns individual studies to subcommittees or to other existing agencies. Whether or not the organizational pattern of the present Committee is the most effective that can be found, there is no doubt that some mechanism is vitally necessary, at the national level, which will have unrestricted technical liaison with international circles on the one hand, and on the other hand equally free communication with the variety of domestic agencies and individuals who are professionally interested in Canadian health statistics.

The high prestige which Canadian health statistics enjoy internationally virtually ensures that Canada will continue to play an important part in international developments in this field. To do so competently will certainly require the same close collaborative effort between governments, voluntary agencies and individuals which has brought our health statistics to their present high level.

Canadian Journal of Public Health

DR. DONALD THOMAS FRASER

AS ONE REVIEWS the development of preventive medicine in Canada, the contributions in the fields of bacteriology and immunology stand out. In the death of Dr. Donald Thomas Fraser, Canada has lost a scientist who made many contributions to the knowledge of infection, treatment, and control.

Accompanied by his wife, Dr. Fraser left Toronto in June on a visit, arranged by the Pan American Sanitary Bureau. to a number of universities in South American countries, including Ecuador, Peru, and Chile. With the courage that characterized his whole life, Dr. Fraser unhesitatingly went forward with his work, in spite of having suffered a serious heart attack several years ago. In making this visit, he welcomed the opportunity of learning the needs of South American students for post-graduate study and of planning how best they could be met. His death occurred suddenly in Santiago, Chile, on July 19th, nine days after he was stricken by a second heart attack.

Dr. Fraser was born in Toronto, son of the late Professor William H. Fraser, who for many years was head of the departments of Italian and Spanish at the University. After obtaining the degree of Bachelor of Arts at the University of Toronto, Dr. Fraser graduated in medicine. When World War I broke out, he at once enlisted, going overseas in March, 1915. First attached to the Royal Army Medical Corps of the British Army, Dr. Fraser served with the 94th Field Ambulance unit in Egypt until late in 1915. In the following year he was awarded the Military Cross for extreme bravery at the Somme. Later he served with the British Expeditionary Force in China, where again he was commended in despatches for gallantry.

On his return to Canada, Dr. Fraser became a member of the Connaught Laboratories and shortly afterwards was appointed to the Department of Hygiene and Preventive Medicine in the Faculty of Medicine. In the years that followed, he played a leading part in the development of the Laboratories and the School of Hygiene.

In his scientific work, Dr. Fraser early became interested in the control of diphtheria. His studies included the transmission of the disease by carriers,

types of organisms, the value of diphtheria toxoid in prevention, and the importance of a recall dose in producing a prolonged immunity. Of the 49 papers that he published in the period from 1920 to 1950, 27 dealt with aspects of the diphtheria problem. The control of diphtheria in Canada is one of the brightest chapters in the history of public health, and in it Dr. Fraser had a large part. He was keenly interested also in tetanus, scarlet fever, and whooping cough. To him, bacteriology and immunology offered an ever-widening field of interest and challenge.

In the Connaught Medical Research Laboratories, of which he was associate director since 1932, and in the School of Hygiene, in which he held a similar appointment, Dr. Fraser gave generously of his time to the forwarding of research by junior members, counselling and encouraging, as well as extending helpful criticism. The research workers in Canada and abroad who have benefitted from his guidance and advice are many. He had a special interest in students from other lands, and his door was always open to graduates from other countries who were endeavouring to establish themselves in Canada. He was a genial host, enjoying the company of others and contributing much to any group in which he found himself. He had a great love of the outdoors; mountains, lakes, and ski trails had a special appeal. His interest in the artistic found expression in painting.

As Professor of Hygiene and Preventive Medicine, he developed the present courses of instruction, which extend over the whole four years of undergraduate training. His influence as a teacher was felt far beyond the University of Toronto.

Dr. Fraser was internationally known, and his friends included leaders in preventive medicine and allied fields in all parts of the world. He was president of the American Association of Immunologists in 1938–39 and of the American Epidemiological Society in 1948. He served on a number of committees of the American Public Health Association, including the Lasker Awards Committee, the Committee on Research and Standards, and the Subcommittee on the Control of Communicable Diseases. As a member of the latter committee, under the chairmanship of Dr. Haven Emerson, Dr. Fraser took an active part in the development and publication of the manual on communicable diseases, in its various revisions. He was a Fellow of the Royal Society of Canada and a senior member of the Canadian Public Health Association.

His death deprives the University of Toronto of an outstanding scientist and teacher, and takes from a wide group of colleagues and former students a cherished friend and counsellor.

NEWS

Federal Health Aid for Provincial Projects

APPROVAL of further federal health grants to the Provinces for a variety of projects, and amounting to more than $150,000, has been announced by the Honourable Paul Martin, Minister of National Health and Welfare.

The largest current contribution, $75,000, under the Hospital Construction Grant in the National Health Program, will assist Saskatchewan in increasing accommodation at the government hospital in Weyburn by construction of a new 150-bed nurses' residence.

A Cancer Control Grant of $50,727 will support operation of a cancer diagnostic and treatment centre at St. Joseph's Hospital, Three Rivers, Quebec. This centre, located between Montreal and Quebec, will fit in with Quebec's province-wide cancer planning and will be used in postgraduate training for physicians of the area. The federal funds, to be matched by a provincial grant, will assist in staffing and equipping the centre.

Ontario will receive $10,333 under the Hospital Construction Grant for an addition which will increase accommodation by seven active treatment beds and 12 bassinets at the Oakville-Trafalgar Memorial Hospital at Oakville.

A Child and Maternal Health Grant of $3,800 to Ontario will assist research in Toronto hospitals relating to complications in pregnancy among women of certain blood types. This study will be directed by Dr. D. E. Cannell, head of the Department of Obstetrics and Gynaecology at the University of Toronto.

A General Public Health Grant of $8,300 to Alberta will support a demonstration program of nurse recruitment among high-school graduates.

Alberta

PLANS ARE WELL ADVANCED for the meeting of the Alberta Public Health Association at the Palliser Hotel, Calgary, on September 1, 2, and 3. Dr. E. A. Watkinson, Chief, Occupational Health Division, Department of National Health and Welfare, Ottawa, is expected to be present. Dr. G. W. O. Moss, Public Health Associate in the Connaught Medical Research Laboratories, University of Toronto, will represent the Canadian Public Health Association, of which he is honorary treasurer. The guest speaker at the banquet will be Dr. E. P. Scarlett, Chancellor of the University of Alberta.

WHEN THE SALK VACCINE unexpectedly became available in Canada last spring, the Department of Public Health in Alberta decided to accept the responsibility of carrying 10,000 vaccinations and 10,000 controls. Because of the short notice, numerous difficulties have arisen, but they have been ironed out and at the present time the third inoculation is being done.

DR. G. A. MOTT has resigned as director of the Red Deer Health Unit and is going to Vancouver.

DR. J. OWEN-FLOOD, of the Vegreville Health Unit, has resigned to go into private practice as an ophthalmologist in the City of Edmonton.

Manitoba

TWO RETIREMENTS have led to several staff changes in the Department of Health and Public Welfare.

Dr. K. J. Backman has retired from his position as Director of the Division of Venereal Disease Control with the Department of Health. He has headed this division since its creation in 1931. For many years Dr. Backman has been in charge of the special treatment clinic at the St. Boniface Hospital Out-Patient Department. He will continue as consultant in charge of the government clinic. Dr. C. C. Wright, who obtained the degrees of M.B., Ch.B., and D.P.H. from Aberdeen University, succeeds Dr. Backman as director of Venereal Disease Control.

Dr. Joseph Gonty, who recently obtained the Diploma in Public Health at the School of Hygiene, University of Toronto, will assume Dr. Wright's duties as Medical Director of the Health Unit at Dauphin.

Dr. N. R. Rawson, O.B.E., B.S.(Lond.), D.P.H.(Tor.), has retired to general practice after serving the Manitoba government for twenty-two years. Dr. Rawson was born in Bradford, Yorkshire, and came to Canada in 1929. After obtaining his public health degree, he first served as an epidemiologist for the

Manitoba Government in Winnipeg, and then as Medical Health Officer for Brandon. From 1934 to 1939 he was director of the laboratory at Brandon Mental Hospital, and from 1939 to 1941 Director of Vital Statistics. During the war, Dr. Rawson served consecutively as Hygiene Officer to the Prairie Command, Hygiene Officer to Camp Borden, and Medical Officer at Chesterfield Inlet, holding the rank of major.

Dr. W. Watt, who has been in charge of the health unit at Neepawa, will fill the post which Dr. Rawson has held for the past eight years as medical director of a health unit serving three suburban municipalities. Dr. R. A. Christie will undertake the temporary direction of the Neepawa Unit.

Dr. J. V. Deshaye, B.A., D.P.H., a graduate of the Universities of Ottawa, Laval and Toronto, assumed in June the duties of medical director of the Red River Health Unit at Steinbach.

SUMMER VISITORS to the Manitoba Department of Health and Public Welfare included Dr. Elisa Wynmalen, of Oegstgeest, Holland. Dr. Wynmalen, who has been studying public health at Yale University, made a cross-country tour of some health departments before returning to Holland, where she will do public health work for the Dutch Government. Mr. James Gibbard, Director of the Department of National Health and Welfare's Laboratory of Hygiene, paid a brief visit in July. His executive assistant, Dr. R. H. Elder, stayed on to conduct a survey of laboratory facilities in Manitoba hospitals.

THE LAST DOSE of Salk serum was administered in July to approximately 7,000 Manitoba children taking part in the polio vaccine field trials. School children in the first three grades from three cities, nine towns, and five suburban municipalities participated in the tests. There have been no unfavorable reactions so far. Results of the tests will be known late in the fall.

ONE HUNDRED PUBLIC HEALTH WORKERS from Winnipeg, St. Boniface and rural Manitoba attended a meeting called by the Manitoba Public Health Association on April 26 to consider rabies as a public health problem. Dr. J. N. Scatliff, president of the Association, emphasized the need for cooperation between veterinarians and public health personnel in preventive work. Through a film on the control of rabies, Dr. R. H. Lay, district veterinarian for the National Department of Agriculture, Health of Animal Branch, supplied a visual explanation of how rabies vaccine is prepared and of the results of rabies in man and in animals. A panel of public health personnel discussed the measures that each would need to take if an outbreak of rabies were to occur in their area.

A SEVEN-DAY COURSE for water plant and sewage disposal works operators at Department of National Defence (Army) installations is being arranged jointly by the Directorate of Works (Army) and the Engineering Bureau of the Manitoba Department of Health and Public Welfare. The schedule will include visits to local municipal systems, discussions, technical lectures, and laboratory procedures based on the observed processes at both water conditioning and sewage treatment plants. The course will run from September 13 to 19. Visits will be made to installations at Winnipeg, Morden, Morris, Portage la Prairie, Camp Shilo and Brandon.

Ontario

ONTARIO'S NEW POLIOMYELITIS REGULATIONS were announced recently by the Honourable Mackinnon Phillips, Minister of Health. Henceforth, the Department of Health will pay eight dollars a day for treatment of every polio patient. This payment begins after the patient has been hospitalized for ten days. An additional two dollars a day is provided for patients who require physiotherapy treatment. Where special nurses are required, the Ontario Government will pay for this service up to an amount of ten dollars for the eight-hour period. These services are available at designated treatment centres, which include all Group A hospitals plus McKellar General Hospital, Fort William; Fred Adams Isolation Hospital, Windsor; Riverdale Isolation Hospital, Toronto; Sudbury General Hospitals; Port Arthur Isolation Hospital and the Kitchener-Waterloo Hospital.

DR. G. K. MARTIN, former Medical Officer of Health for the Muskoka District Health Unit, has been appointed to the staff of the Ontario Department of Health's Division of Venereal Disease Control. Dr. H. J. Lambert is the new medical officer for the Muskoka Unit.

DR. ARTHUR L. MAGILL has been appointed Medical Inspector of Private Hospitals for Ontario.

DR. W. L. BELL has been named Medical

Officer of Health for the Kenora-Keewatin-Dryden Area Health Unit.

MAJOR A. S. O'HARA, C.D., M.R.San.I., C.S.I.(C.), Regional Consultant in Sanitation for the Ontario Department of Health and secretary of the departmental committee in charge of the Ontario Sanitary Inspectors' Training Course, has been made a Fellow of the Royal Sanitary Institute in recognition of noteworthy work in the field of sanitation over a quarter of a century.

New Brunswick

THE HON. J. F. MCINERNEY, M.D., Minister of Health and Social Services for New Brunswick, informed the semi-annual meeting of the division directors, chaired by the Chief Medical Officer, Dr. J. A. Melanson, that the Government's new polio clinic and health centre in Fredericton is expected to open next October.

AT A MAY MEETING of the Arthritis Campaign Committee of the New Brunswick Division, Canadian Arthritis and Rheumatism Society, the chairman, Dr. A. B. Walter, and the provincial chairman of the drive, Mr. A. Calp, announced that preliminary arrangements have been completed for the establishment of a new Arthritis Clinic to serve Moncton and the surrounding area. The clinic is to be established in the new Moncton Hospital. These officials met with Mr. R. B. Bannon and Dr. C. R. Baxter, representing the Moncton Branch of the Society, and Dr. D. F. W. Porter, superintendent of the Moncton Hospital.

DR. R. R. PROSSER, Director of Mental Health Services of the Mental Health Division of the Provincial Department of Health and Social Services, was awarded a citation and gold wrist watch by the Canadian Mental Health Association for the most outstanding contribution to mental health work in the Province. The Rev. E. T. McKnight, vice-president of the Association, made the presentation.

AT THE ANNUAL MEETING of the New Brunswick Division of the Canadian Mental Health Association, Colin B. MacKay, President of the University of New Brunswick, was elected to head the Association. He succeeds Dr. Clayton Baxter, Professor of Philosophy at Mount Allison University. Dr. Ernest Poser's report as chairman of the Scientific Planning Committee was read by Dr. Lynn Newbigging, secretary of the committee. The report recommended that the major project for the coming year be studies leading to the establishment of a school for mentally retarded children.

AT A TWO-DAY HOSPITAL DISASTER Institute held in Halifax in April, the New Brunswick Department of Health and Social Services was represented by Dr. R. S. Langstroth, Chairman of New Brunswick Civil Defence Health Services; H. D. Warren, Inspector, Hospital Division; and Dr. R. D. Landry, Moncton, District Medical Health Officer. Representatives were also sent from the Hotel Dieu Hospitals at Chatham and Edmundston and from the Saint John General Hospital.

THE TWELFTH ANNUAL MEETING of the Maritime Hospital Association, held at the Algonquin Hotel in St. Andrews, included a panel discussion on "Hospital Planning for the Future". The leader was Dr. R. J. Dolan, Director of Hospital Services and Cancer Diagnostic Services of the New Brunswick Health Department. Participating with Dr. Dolan were Dr. D. F. W. Porter, Moncton, and J. B. Langley, Toronto.

DR. G. E. MADDISON, Director of Tuberculosis Control for New Brunswick, was installed as President of the Canadian Tuberculosis Association at its 1954 annual meeting in Saint John.

ON JUNE 23RD the first patients were being received in the new Provincial Hospital in Campbellton. Dr. R. C. Eaton is superintendent.

DR. PAUL M. TRACEY, B.Sc., M.A., bacteriologist with the Bureau of Laboratories, Saint John, has been awarded a Master of Arts degree in medical bacteriology from the University of Toronto. His research, done under the direction of Dr. Donald Fraser and Dr. Frank Wishart, was on bacteriophage active against the mycobacteria.

MR. JOHN KEAYS, B.Sc., M.P.H., has been appointed health educator with the New Brunswick Department of Health and Social Services.

Nova Scotia

A DIVISION OF CHILD AND MATERNAL HEALTH has been set up in Nova Scotia to strengthen and expand the Province's health service to expectant mothers and to children up to the school-entering age.

Announcement of this new program in the field of public health was made recently by

Premier Harold Connolly, Minister of Public Health and Welfare. Dr. Eldon L. Eagles, in charge of the Fundy Health Division and later the Western Health Division for the past fourteen years, has been appointed director of the new division.

Dr. G. Graham Simms, Deputy Assistant Minister of Health, under whose supervision the new division was set up, has announced that plans also call for the appointment of a nurse as a supervisor consultant to the Dalhousie Medical School, public health nurses, and local hospitals.

As an essential part of the program, the Division has an advisory committee under the chairmanship of Dr. H. B. Attlee, Professor of Obstetrics, Dalhousie University. It has twelve other members from the Departments of Obstetrics, Epidemiology, and Psychiatry, and from Dalhousie University, Grace Maternity Hospital, Halifax City Department of Health, and the Nova Scotia Department of Public Health.

THE FOURTH ANNUAL MEETING of the Atlantic Branch, Canadian Public Health Association, will be held at the Isle Royale Hotel, Sydney, on September 9th and 10th, under the presidency of Dr. H. E. Kelley. There will be three general sessions and five Section meetings in the fields of Diseases of the Chest, Nutrition, Sanitation, and Industrial Nursing. Two symposia are planned for presentation at the general sessions: "Facilities Available to Help Rehabilitate" and "Health of the School Child". On the evening of the first day a banquet will be tendered by the Department of Public Health, Province of Nova Scotia. On this occasion the speaker will be Magistrate E. MacK. Forbes, of Glace Bay, who will talk on "The Life of Giant MacAskill". Reservations for hotel accommodation should be made as soon as possible with the management of the Isle Royale Hotel, Sydney, N.S., giving the proposed time of arrival and indicating attendance at the annual meeting of the Canadian Public Health Association, Atlantic Branch.